

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended.

Permit No.	MO-0137642
Owner:	Ameren Missouri
Address:	1901 Choteau Avenue, St. Louis, MO 63166-6149
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Huster Substation
Facility Address:	3760 Huster Road, St. Charles, MO 63301
Legal Description:	NW¼, NW¼, Section 24, T47N, R4E, St. Charles County
UTM Coordinates:	X= 714407, Y=4300026
Receiving Stream:	Unnamed Waterbody (U)
First Classified Stream and ID:	N/A No surface connection
USGS Basin & Sub-watershed No.:	07110009-0105

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 - Groundwater Containment System/Air Stripping to Remove Chlorinated Volatile Organic Compounds (CVOCs) – SIC #4911

Design flow is 89,280 gallons per day.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Sections 640.013, 621.250, and 644.051.6 of the Law.

April 1, 2014
Effective Date

December 22, 2016
Modification Date

March 31, 2019
Expiration Date

Harry D. Pozzani, Director, Department of Natural Resources

John Madras, Director, Water Protection Program

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 7	
PERMIT NUMBER MO-01379642						
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001***						
Flow	MGD	*		*	once/month	24 hr. total
pH – Units	SU	**		**	once/month	grab
cis-1,2 – Dichloroethylene (DCE)	µg/L	141		70	once/month	grab
Vinyl Chloride (VC)	µg/L	4		2	once/month	grab
Tetrachloroethylene (PCE)	µg/L	1.6		0.8	once/month	grab
Trichloroethylene (TCE)	µg/L	10.1		5	once/month	grab
Iron (Influent)	µg/L	*		*	once/month	grab
Iron (Effluent)	µg/L	*		*	once/month	grab
Iron (Net)	µg/L	603		603	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE <u>July 28, 2014</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) test	% Survival	See Special Conditions			once/permit cycle	grab
MONITORING REPORTS SHALL BE SUBMITTED ONCE / PERMIT CYCLE; THE FIRST REPORT IS DUE <u>January 28, 2019</u> .						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6-9 pH units.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated November 1, 2013, and hereby incorporated as though fully set forth herein.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which

C. SPECIAL CONDITIONS (CONTINUED)

- (d) are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Water Quality Standards

- (a) To the extent required by law, discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.

- (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

- (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
- (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
- (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
- (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
- (5) There shall be no significant human health hazard from incidental contact with the water;
- (6) There shall be no acute toxicity to livestock or wildlife watering;
- (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
- (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
- (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established by the Director in accordance with 40 CFR 122.44(f).
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Report as no-discharge when a discharge does not occur during the report period.

6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

7. Good housekeeping practices shall be maintained on the site to keep solid waste from entry into waters of the state.

8. Any pesticide discharge from any point source shall comply with the requirements of Federal Insecticide, Fungicide and Rodenticide Act, as amended (7 U.S.C. 136 et. seq.) and the use of such pesticides shall be in a manner consistent with its label..

C. SPECIAL CONDITIONS (CONTINUED)

9. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
 - (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of storm water from these substances.
 - (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
 - (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of storm water with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
 - (d) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
 - (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits.
10. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained on site and made available to the department upon request.
11. Electronic Discharge Monitoring Report (eDMR) Submission System
 - (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
 - (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
 - (1) Schedule of Compliance Progress Reports;
 - (2) Annual Reports;
 - (c) Any additional report required by the permit: After such a system has been made available by the department, required data shall be directly input into the system by the next report due date.
 - (d) Other actions. The following shall be submitted electronically after such a system has been made available by the department:
 - a. General Permit Applications/Notices of Intent to discharge (NOIs);
 - b. Notices of Termination (NOTs);
 - c. No Exposure Certifications (NOEs);
 - (e) Electronic Submissions. To access the eDMR system, use the following link in your web browser: <https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx>.
 - (f) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: <http://dnr.mo.gov/forms/780-2692-f.pdf>. The department will either approve or deny this electronic reporting waiver request within 120 calendar days. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective.

D. SCHEDULE OF COMPLIANCE

Not Applicable.

E. WHOLE EFFLUENT TOXICITY

Whole Effluent Toxicity (WET) Test shall be conducted as follows:

Dilution Series						
AEC%	100% effluent	50% effluent	25% effluent	12.5% effluent	6.25% effluent	(Control) 100% Lab Water, also called synthetic water

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a MULTIPLE-dilution acute WET test in the months and at the frequency specified above. For tests which are successfully passed, submit test results using the Department's WET test report form #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (i) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
 - (ii) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analysis performed upon any other effluent concentration.
 - (iii) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
- (2) The WET test will be considered a failure if mortality observed in effluent concentrations for either specie, equal to or less than the AEC, is significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available, synthetic laboratory control water may be used.
- (3) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (4) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (4) If the effluent fails the test for BOTH test species, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur, but not less than 7 days apart) until one of the following conditions are met: Note: Written request regarding single species multiple dilution accelerated testing will be address by THE WATER PROTECTION PROGRAM on a case by case basis.
 - (i) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (ii) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (5) Follow-up tests do not negate an initial failed test.
- (6) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the third failed test.

E. WHOLE EFFLUENT TOXICITY (CONTINUED)

- (7) Additionally, the following shall apply upon failure of the third follow up MULTIPLE DILUTION test. The permittee should contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. If the permittee does not contact THE WATER PROTECTION PROGRAM upon the third follow up test failure, a toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of the automatic trigger or DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
 - (8) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
 - (9) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
 - (10) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.
 - (11) Submit a concise summary in tabular format of all WET test results with the report.
- (b) Test Conditions
- (1) Test Type: Acute Static non-renewal
 - (2) All tests, including repeat tests for previous failures, shall include both test species listed below unless approved by the department on a case by case basis.
 - (3) Test species: *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
 - (4) Test period: 48 hours at the "Allowable Effluent Concentration" (AEC) specified above.
 - (5) Upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
 - (6) Tests will be run with 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent, and reconstituted water.
 - (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
 - (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.
 - (9) Whole-effluent-toxicity test shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms

MISSOURI DEPARTMENT OF NATURAL RESOURCES
EDMR STATEMENT OF BASIS
MO-0137642
AMEREN MISSOURI – HUSTER SUBSTATION

This Statement of Basis gives pertinent information regarding an internal minor permit modification to the above listed operating permit without the need for a public comment process. A statement of basis is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

Facility Type: Industrial

Part II – Modification Rationale

This operating permit was modified by adding a special condition (#11) to require the permittee to submit all discharge monitoring reports electronically (eDMR) to the department. The final rule (eReporting Rule) substitutes electronic reporting for paper-based reports and, over the long term, saves time and resources for permittees, states, tribes, territories, and EPA, while improving compliance and better protecting the Nation's waters. The final rule requires permittees and regulators to use existing, available information technology to electronically report information and data related to the NPDES permit program in lieu of filing paper-based reports. All authorized programs are required to electronically transmit the federally-required data (identified in appendix A to 40 CFR part 127) to EPA. The purpose and need for this rule was highlighted in the development of the Clean Water Act Enforcement Action Plan (Plan). Announced by EPA in October 2009, the Plan was a collaborative effort by EPA and state environmental agencies to explore opportunities to improve water quality by emphasizing and adopting new approaches that will improve how the NPDES permitting and enforcement program is administered. The goals of the Plan include improving transparency of the information on compliance and enforcement activities in each state, connecting this information to local water quality, and providing the public with real-time, easy access to this information. The rule became effective December 21, 2015.

The permit was changed from quarterly reporting to monthly reporting. Page numbers were updated. No other changes were made at this time to this permit.

Part III – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. None of these changes require public notice.

DATE OF STATEMENT OF BASIS: DECEMBER 5, 2016

COMPLETED BY:

PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT
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**MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE
OF
MO-0137642
AMEREN MISSOURI HUSTER SUBSTATION**

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for an Industrial Facility.

Part I – Facility Information

Facility Type: Industrial Groundwater Containment System/Air Stripping to Remove Chlorinated Volatile Organic Compounds (CVOCs)
Facility SIC Code(s): 4911

Facility Description:

Groundwater treatment system designed to remove greater than 99 percent of the dissolved chlorinated volatile organic compounds (CVOCs) by the use of a 62 gallon per minute air stripper. The design flow of this new facility will be 0.89 MGD.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

☐ - Yes; (please provide simple description or reference appropriate location in the Fact Sheet).
☒ - No.

Application Date: 10/08/13
Expiration Date: mm/dd/yy
Last Inspection: N/A In Compliance ☐; Non-Compliance ☐

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
#001	0.14	Air Stripper	Process Wastewater

Part II – Receiving Stream Information

Receiving Water Body's Water Quality: No history for this facility. Although located in the Dardenne Creek watershed, the discharge from this facility is not expected to have a direct surface connection with Dardenne Creek as there are several levees in the area that have altered the flow lines of the water courses. This was confirmed by a "ground truthing" visit conducted by Ameren's contractor Barr Engineering, which summarized their findings on a map supplied with the Antidegradation application.

U.S. EPA Region 7 (USEPA) and Ameren Missouri (Ameren) entered into a Settlement Agreement and Administrative Order on Consent for the Ameren Huster Road electrical substation property, which requires Ameren to design, install, and operate a groundwater containment system (GCS) to capture and treat on-site groundwater affected by chlorinated volatile organic compounds (CVOCs) at concentrations exceeding Missouri Risk-Based Corrective Action (MRBCA) default target levels (DTLs), corresponding to federal Maximum Contaminant Levels (MCLs). This project is in response to these shallow groundwater treatment requirements

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri's Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

Missouri or Mississippi River [10 CSR 20-7.015(2)]: ☐
 Lake or Reservoir [10 CSR 20-7.015(3)]: ☐
 Losing [10 CSR 20-7.015(4)]: ☐
 Metropolitan No-Discharge [10 CSR 20-7.015(5)]: ☐
 Special Stream [10 CSR 20-7.015(6)]: ☐
 Subsurface Water [10 CSR 20-7.015(7)]: ☒
 All Other Waters [10 CSR 20-7.015(8)]: ☒

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC**
Unnamed Waterbody	U		General Criteria	N/A	07110009-0105

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW). ** - Hydrologic Unit Code

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed Waterbody	0.0	0.0	0.0

RECEIVING STREAM MONITORING REQUIREMENTS:

No receiving water monitoring requirements recommended at this time.

Part III – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

☒ Not Applicable; The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(l)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

☒ - New facility, backsliding does not apply.

ANTIDegradation:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

☒ - New and/or expanded discharge, please see APPENDIX # A- ANTIDegradation ANALYSIS.

BIOSOLIDS & SEWAGE SLUDGE:

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Additional information regarding biosolids and sludge is located at the following web address: <http://dnr.mo.gov/env/wpp/pub/index.html>, items WQ422 through WQ449.

☒ Not applicable; This condition is not applicable to the permittee for this facility.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

☒ Not Applicable; The permittee/facility is not currently under Water Protection Program enforcement action.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

☒ Not Applicable; A RPA was not conducted for this facility.

SCHEDULE OF COMPLIANCE (SOC):

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

☒ Not Applicable; This permit does not contain a SOC.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

☒ Not Applicable; At this time, the permittee is not required to develop and implement a SWPPP.

SPILL REPORTING:

Per 10 CSR 24-3.010, any emergency involving a hazardous substance must be reported to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the Noncompliance Reporting requirement found in Standard Conditions Part I.

VARIANCE:

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

☒ Not Applicable; This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

☒ Applicable; Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Number of Samples "n":

Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

☒ Not Applicable; Wasteload allocations were not calculated.

WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

☒ Not Applicable; A WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

☒ Applicable;

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(3)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by all facilities meeting the following criteria:

- ☐ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☐ Facility (industrial) that alters its production process throughout the year.
- ☒ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☒ Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- ☐ Facility is a municipality or domestic discharger with a Design Flow \geq 22,500 gpd.
- ☐ Other – please justify.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

☒ Not Applicable; This facility does not discharge to a 303(d) listed stream.

Part IV – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	*		*		ONCE/MONTH
pH	SU	6-9		6-9		ONCE/MONTH
CIS-1,2 – DICHLOROETHYLENE (DCE)	MG/L	141		70		ONCE/MONTH
VINYL CHLORIDE (VC)	SU	4		2		ONCE/MONTH
TETRACHLOROETHYLENE (PCE)	MG/L	1.6		0.8		ONCE/MONTH
TRICHLOROETHYLENE (TCE)	MG/L	10.1		5		ONCE/MONTH
IRON (INFLUENT)	MG/L	*		*		ONCE/MONTH
IRON (EFFLUENT)	***	*		*		ONCE/MONTH
IRON (NET)	MG/L	603		603		ONCE/MONTH
PHOSPHORUS	MG/L	*		*		ONCE/MONTH
WHOLE EFFLUENT TOXICITY (WET) TEST	% Survival	Please see WET Test in the Derivation and Discussion Section below.				

* - Monitoring requirement only.

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **pH.** pH shall be maintained in the range from six to nine (6–9) standard units [10 CSR 20-7.015(8)(A)2.].
- **cis-1,2-Dichloroethylene (DCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of DCE. The concentration of the influent is estimated to be 9.6 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 96 µg/L. There is no Human Health Protection-Fish Consumption criteria (HHF) for PCE, nor is there an aquatic life criteria. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 144µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 70 µg/L for DCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 141 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Effluent Limitations Table.

- **Vinyl Chloride.** According to EPA technical documents, air stripping is capable of removing at least 99 percent of Vinyl Chloride. The concentration of the influent is estimated to be 0.28 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 2.8 µg/L. The HHF for PCE is 525 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 4.2 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 2 µg/L for Vinyl Chloride. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 4.0 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Effluent Limitations Table.

- **Tetrachloroethylene (PCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of PCE. The concentration of the influent is estimated to be 0.121 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 1.21 µg/L. The HHF for PCE is 8.85 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 1.82 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 0.8 µg/L for PCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 1.61 µg/L.

The most stringent limit will apply (groundwater criteria), and is reflected in Effluent Limitations Table.

- **Trichloroethylene (TCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of TCE. The concentration of the influent is estimated to be 0.96 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 9.6 µg/L. The HHF for TCE is 80 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 14.4 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 5 µg/L for TCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 10.1 µg/L.

The most stringent limit will apply (groundwater criteria), and is reflected in Effluent Limitations Table.

- **Iron, Total Recoverable.** Iron is naturally occurring in the groundwater underlying the site and will be present in the influent and in the discharge from the air stripper treatment unit. As mentioned previously, the air stripper unit is not intended or designed to remove iron from the groundwater. This effluent limitation is designed to limit the discharge of iron from the air stripper to the iron that is naturally occurring and contained in the groundwater that air stripper unit will be treating.

The net Iron effluent limitation is to be determined by subtracting the total iron concentration in the influent to the air stripper from the total iron concentration in the effluent. This effluent limitation is to be a net effluent limitation in a manner outlined in federal regulations (40 CFR 122.45(g)).

- **Total Phosphorus.** Monitoring requirement only. The department does not have an implementation plan for nutrients, but the facility is proposing to use a phosphorus compound for control of iron fouling in the air stripper trays, therefore the department is proposing that the facility collect monitoring data. The antidegradation report mentions an effluent concentration of 1.5 mg/L.

Antidegradation does not apply to subsurface discharges, however, limits in an operating permit will be developed to protect groundwater. This arises from the fact that there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area.

- **WET Test.** WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.

- ☐ Chronic
☒ Acute

☒ **No less than ONCE/PERMIT CYCLE:**

- ☐ Municipality or domestic facility with a design flow \geq 22,500 gpd, but less than 1.0 MGD.
☒ Other, please justify.

☐ **No less than ONCE/YEAR:**

- ☐ Facility is designated as a Major facility or has a design flow \geq 1.0 MGD.
☐ Facility continuously or routinely exceeds their design flow.
☐ Facility exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
☐ Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).

☐ **No less than TWICE/YEAR:**

- ☐ Facility is subject to production processes alterations throughout the year.
☐ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
☐ Facility has been granted seasonal relief of numeric limitations.

Acute and/or Chronic Allowable Effluent Concentrations (AECs) for facilities that discharge to unclassified, Class C, Class P (with default Mixing Considerations), or Lakes [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] are 100%, 50%, 25%, 12.5%, & 6.25%.

Part V- Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PERMIT SYNCHRONIZATION:

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than three years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

PUBLIC NOTICE:

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

☒ - The Public Notice period for this operating permit is tentatively scheduled to begin on January 31, 2014.

DATE OF FACT SHEET: JANUARY 24, 2014

COMPLETED BY:

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Water Quality and Antidegradation Review

*For the Protection of Water Quality
and Determination of Effluent Limits for Discharge
by
Ameren – Huster Substation Groundwater Treatment System*



January 2013

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1. Facility Information

FACILITY NAME: Ameren – Huster Substation Groundwater Treatment System NPDES #: NEW FACILITY

FACILITY TYPE/DESCRIPTION: As a result of the submitted alternative analysis, the applicant's preferred alternative is a 62 gallon per minute air stripper designed to remove greater than 99.9 percent of the dissolved chlorinated volatile organic compounds (CVOCs). The design flow of this new facility will be 0.089 MGD.

COUNTY: St. Charles UTM COORDINATES: X= 714407/ Y= 4300026
12- DIGIT HUC: 07110009-0105 LEGAL DESCRIPTION: NW¼, NW¼, Section 24, T47N, R4E
EDU*: Central Plains/Cuivre/Salt ECOREGION: Big River Floodplain

* - Ecological Drainage Unit

2. Water Quality Information

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. Water Quality History:

No history for this facility. Although located in the Dardenne Creek watershed, the discharge from this facility is not expected to have a direct surface connection with Dardenne Creek as there are several levees in the area that have altered the flow lines of the water courses. This was confirmed by a "ground truthing" visit conducted by Ameren's contractor Barr Engineering, which summarized their findings on a map supplied with the Antidegradation application.

U.S. EPA Region 7 (USEPA) and Ameren Missouri (Ameren) entered into a Settlement Agreement and Administrative Order on Consent for the Ameren Huster Road electrical substation property, which requires Ameren to design, install, and operate a groundwater containment system (GCS) to capture and treat on-site groundwater affected by chlorinated volatile organic compounds (CVOCs) at concentrations exceeding Missouri

Risk-Based Corrective Action (MRBCA) default target levels (DTLs), corresponding to federal Maximum Contaminant Levels (MCLs). This project is in response to these shallow groundwater treatment requirements.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.14	Air Stripper	Unnamed Waterbody	N/A

3. Receiving Waterbody Information

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Unnamed Waterbody	U	-	0.0	0.0	0.0	General Criteria

** Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cold Water Fishery (CDF), Cool Water Fishery (CLF), Drinking Water Supply (DWS), Industrial (IND), Irrigation (IRR), Livestock & Wildlife Watering (LWW), Secondary Contact Recreation (SCR), Whole Body Contact Recreation (WBC).

RECEIVING WATER BODY SEGMENT #1: Unnamed Waterbody

Upper end segment* UTM coordinates: X= 714407/ Y= 4300026 (Outfall)

Lower end segment* UTM coordinates: X= 711720/ Y= 4300784 (levee at Dardenne Creek)

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

Once the treated water is discharged to the Unnamed Waterbody, the water is expected to spread, disperse, and percolate into the groundwater of the area. It is therefore, appropriate to consider the impact of this discharge on groundwater, and permit limits may be developed for the protection of groundwater.

4. General Comments

Barr Engineering prepared, on behalf of Ameren Services, the *Antidegradation Review for Huster Substation* dated October 2013. Geohydrological Evaluation request was not submitted as Barr Engineering had an in-house geologist verify that the receiving stream is gaining for discharge purposes (Appendix A: Map). Applicant elected to assume that all pollutants of concern (POC) are significantly degrading the receiving stream in the absence of existing water quality. An alternative analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix B was used to develop this review document. A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant; and no records of endangered species were found for the project area. This project has minimal construction and disturbance of land in the immediate vicinity of Huster Substation and primarily involves the permitting of a discharge of treated groundwater to surface water. No known sensitive habitats or threatened and endangered species are known to exist that will be negatively impacted by the minor construction activities or discharge associated with this project.

5. Antidegradation Review Information

The following is a review of the *Antidegradation Review for Huster Substation* dated October 2013.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants “proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge.” (AIP, Page 7). Tier 2 was assumed for all POCs (see Appendix B).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
pH	2	Significant	***
CIS-1,2 – DICHLOROETHYLENE (DCE)	2	Significant	**
VINYL CHLORIDE (VC)	2	Significant	**
TETRACHLOROETHYLENE (PCE)	2	Significant	**
TRICHLOROETHYLENE (TCE)	2	Significant	**
PHOSPHORUS	2	Significant	**
IRON	1	Nondegrading	Groundwater standard

* Tier assumed. Tier determination not possible: ** No in-stream standards for these parameters. *** Standard for this parameter is a range.

The following Antidegradation Review Summary attachments in Appendix B were used by the applicant:

- ☒ Attachment A, Tier 2 with significant degradation.
- ☐ Attachment B, Tier 2 with minimal degradation.
- ☐ Attachment D, Tier 1 Review. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. All POCs were assumed to be Tier 2 and significantly degraded in the absence of existing water quality.

5.3. ALTERNATIVE ANALYSIS

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance included in the report. Non-degrading alternatives such as land application, water reuse, and groundwater reinjection were considered not practicable due to lack of available land, industrial users, storage, and/or negative public perception of each alternative. The report also stated regionalization was not practicable due to City of St. Charles having an ordinance, which does not allow discharge of groundwater into City sewers. The report did not include a detailed analysis of less degrading alternatives as the base case is proposed to remove greater 99.9% of the Chlorinated Volatile Organic Compounds (CVOCs). Based on an EPA's "Cost-Effective Design of Pump and Treat Systems" [EPA542-R-05-008, April 2005], air stripping is the appropriate treatment technology for addressing the pollutants of concern. The document cites air stripping's high removal efficiency, its relatively low capital and operating costs, and the fact that system manufacturers provide standard "off-the-shelf" designs that often provide performance safety factors because additional capacity adds little to the cost.

The only practicable option presented in the application is a low-profile sieve tray air stripper. The low-profile air stripping unit is the preferred alternative, because of the proven and reliable performance and ease of maintenance. A low-profile sieve tray air stripper will be used to remove dissolved CVOCs from the influent groundwater stream. The air stripper will operate at an air flow rate of 600 cubic feet per minute, which results in an air-to-water ratio of 72:1 at the design flow of 62 gallons per minute. At this air-to-water ratio, the air stripper is predicted to remove greater 99.9% of CVOCs. Prior to the air stripping unit, the groundwater will be dosed with an anti-scalant to address elevated iron and hardness and reduce the likely scale buildup on the air stripper trays. The anti-scalant proposed is phosphorus based. Bag filters will also be used to remove any precipitated particulates before and after the air stripper. The Groundwater Treatment System will be provided by National Environmental Systems (NES) as a pre-packaged turnkey system installed inside a 40 foot long by 8 feet wide cargo box enclosure.

5.4. DEMONSTRATION OF SOCIAL AND ECONOMIC IMPORTANCE

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance that was included in the report.

The applicant first identified the community that will be affected by the proposed degradation of water quality. The affected community is likely within the City of St. Charles. The City is dependent on radial, public drinking water wells located near the substation site. Protection of the groundwater from which the City's wells draw is a primary socio economic consideration. The area in immediate proximity to the site is currently used primarily for agricultural, industrial, and recreational purposes. Row crops and commercial facilities are to the west. Fountain Lakes Park borders the site on the north, east, and south and has two fishing lakes, a skate park, and a walking trail. The uses adjacent to this site should not be negatively impacted by the groundwater treatment system.

6. General Assumptions of the Water Quality and Antidegradation Review

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D)] consideration for no discharge has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per 10 CSR 20-7.015(4) Losing Streams and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

7. Mixing Considerations

Mixing Zone (MZ): Not Allowed [10 CSR 20-7.031(4)(A)4.B.(1)(a)].

Zone of Initial Dilution (ZID): Not Allowed [10 CSR 20-7.031(4)(A)4.B.(1)(b)]

8. Permit Limits and Monitoring Information

WASTELoad ALLOCATION
STUDY CONDUCTED (Y OR N):

☐ N

USE ATTAINABILITY
ANALYSIS CONDUCTED (Y OR N):

☐ N

WHOLE BODY CONTACT
USE RETAINED (Y OR N):

☐ N

OUTFALL #001

WET TEST (Y OR N): ☐ Y FREQUENCY: ONCE/YEAR AEC: 100% METHOD: MULTIPLE

* Based upon industrial process wastewater requirements and best professional judgment of the pollutant types.

TABLE 3. ANTIDEGRADATION EFFLUENT LIMITS OUTFALL 001

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*		Once/Month
PH	SU	6-9		6-9	FSR	Once/Month
CIS-1,2 - DICHLOROETHYLENE (DCE)	µg/L	141		70	PEL	Once/Month
VINYL CHLORIDE (VC)	µg/L	4		2	PEL	Once/Month
TETRACHLOROETHYLENE (PCE)	µg/L	1.6		0.8	PEL	Once/Month
TRICHLOROETHYLENE (TCE)	µg/L	10.1		5	PEL	Once/Month
IRON (INFLUENT)	µg/L	*		*	N/A	Once/Month
IRON (EFFLUENT)	µg/L	*		*	N/A	Once/Month
IRON (NET)	µg/L	603		603	WQBEL	Once/Month
PHOSPHORUS	MG/L	*		*	N/A	Once/Month

NOTE 1- WATER QUALITY-BASED EFFLUENT LIMITATION --WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT--MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT-PEL; TECHNOLOGY-BASED EFFLUENT LIMIT-TBEL; OR NO DEGRADATION EFFLUENT LIMIT--NDEL; OR FSR --FEDERAL/STATE REGULATION; OR N/A--NOT APPLICABLE. ALSO, PLEASE SEE THE GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.

* - Monitoring requirements only.

9. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

10. Derivation and Discussion of Limits

Wasteload allocations and limits were calculated using two methods:

1) Water quality-based - Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow

C_e = effluent concentration

Q_e = effluent flow

Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality-based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

- 2) Alternative Analysis-based – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD₅ and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL). For toxic and nonconventional pollutant such as ammonia, the treatment capacity is applied as the significantly-degrading effluent monthly average (AML). A maximum daily can be derived by dividing the AML by 1.19 to determine the long-term average (LTA). The LTA is then multiplied by 3.11 to obtain the maximum daily limitation. This is an accepted procedure that is defined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Note: Significantly-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP. Also under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average BOD₅ and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD₅ and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

Since the facility is not expected to affect Dardenne Creek as there does not appear to be a direct surface connection between the treatment system and Dardenne Creek as there are several levees in the area that have altered the flow lines of the water courses, the facility has Preferred Alternative Effluent Limits for most of the pollutants of concern as these pollutants only have chronic criteria. The treatment technology selected is more than capable of meeting the proposed Preferred Alternative Effluent Limits in this section.

10.1. OUTFALL #001 – MAIN FACILITY OUTFALL

10.2. LIMIT DERIVATION

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **pH.** pH shall be maintained in the range from six to nine (6– 9) standard units [10 CSR 20-7.015(8)(A)2.].
- **cis-1,2-Dichloroethylene (DCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of DCE. The concentration of the influent is estimated to be 9.6 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 96 µg/L. There is no Human Health Protection-Fish Consumption criteria (HHF) for PCE, nor is there an aquatic life criteria. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 144µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 70 µg/L for DCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 141 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Table 3.

- **Vinyl Chloride.** According to EPA technical documents, air stripping is capable of removing at least 99 percent of Vinyl Chloride. The concentration of the influent is estimated to be 0.28 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 2.8 µg/L. The HHF for PCE is 525 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 4.2 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 2 µg/L for Vinyl Chloride. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 4.0 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Table 3.

- **Tetrachloroethylene (PCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of PCE. The concentration of the influent is estimated to be 0.121 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 1.21 µg/L. The HHF for PCE is 8.85 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 1.82 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 0.8 µg/L for PCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 1.61 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Table 3.

- **Trichloroethylene (TCE).** According to EPA technical documents, air stripping is capable of removing at least 99 percent of TCE. The concentration of the influent is estimated to be 0.96 mg/L. Applying the 99 percent removal efficiency yields a minimum technology-based effluent limit of 9.6 µg/L. The HHF for TCE is 80 µg/L, however consumption of fish from the unnamed waterbody is not expected, therefore, an HHF limit will not be developed. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 1.5, thus the MDL is 4.4 µg/L.

Although Antidegradation applies solely to surface waters, operating permits consider groundwater impacts. Since there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area, the effluent is assumed to impact groundwater. The chronic criteria for the protection of groundwater is 5 µg/L for TCE. To derive the Monthly Daily Maximum (MDL), the average monthly limit was multiplied by 2.01, thus the MDL = 10.1 µg/l.

The most stringent limit will apply (groundwater criteria), and is reflected in Table 3.

- **Iron, Total Recoverable.** Iron is naturally occurring in the groundwater underlying the site and will be present in the influent and in the discharge from the air stripper treatment unit. As mentioned previously, the air stripper unit is not intended or designed to remove iron from the groundwater. This effluent limitation is designed to limit the discharge of iron from the air stripper to the iron that is naturally occurring and contained in the groundwater that air stripper unit will be treating.

The net Iron effluent limitation is to be determined by subtracting the total iron concentration in the influent to the air stripper from the total iron concentration in the effluent. This effluent limitation is to be a net effluent limitation in a manner outlined in federal regulations (40 CFR 122.45(g)).

- **Total Phosphorus.** Monitoring requirement only. The department does not have an implementation plan for nutrients, but the facility is proposing to use a phosphorus compound for control of iron fouling in the air stripper trays, therefore the department is proposing that the facility collect monitoring data. The antidegradation report mentions an effluent concentration of 1.5 mg/L.

Antidegradation does not apply to subsurface discharges, however, limits in an operating permit will be developed to protect groundwater. This arises from the fact that there does not appear to be a direct surface water connection with Dardenne Creek due to the intricate levee system of this area.

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed new facility discharge, Ameren – Huster Substation Groundwater Treatment System, 0.089 MGD is assumed to result in significant degradation of the segment identified. A low-profile sieve tray air stripper unit was determined to be the base case technology (lowest cost alternative that meets technology and water quality based effluent limitations. The cost effectiveness of the other technologies were evaluated, and the air stripper was found to be cost effective and was determined to be the preferred alternative. The chlorinated volatile organic compounds (CVOCs), which are the pollutants of concern, are proposed to have effluent limits based on the capabilities of the preferred alternative capabilities.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. MDNR has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewers: Keith Forck, P.E. & John Rustige, P.E.

Date: 1/27/2014

Section Chief: Refaat Mefrakis, P.E.

Appendix A: Map of Discharge Location

(A USGS topographic map can be obtained on the web at <http://www.dnr.mo.gov/internetmapviewer/>)

